NOTES.

The Council of the British Association has nominated Prof. Flower for the Presidency of the meeting to be held next year at Newcastle.

The annual *conversazione* of the Royal Society will be held on Wednesday, May 9.

The Council of the Marine Biological Association has appointed Mr. Gilbert C. Bourne, M.A., F.L.S., Fellow of New College, Oxford, to be Director and Secretary of the Plymouth Laboratory. Mr. Bourne began the study of biology under Dr. P. Herbert Carpenter at Eton College, and in 1881 obtained an exhibition in natural science at New College. After studying under Prof. Moseley at Oxford and Prof. Aug. Weismann at Freiburg in Baden, Mr. Bourne was placed in the first class in the honour school of natural science at Oxford in 1885. Immediately after taking his degree he proceeded to Diego Garcia in the Indian Ocean, with the purpose of investigating the fauna and flora of that island. On his return to England he became assistant to Prof. Moseley at Oxford, and has performed the duties of Lecturer and Demonstrator in Animal Morphology for the last two years. In October last Mr. Bourne was elected to an open Fellowship at New College.

On the evening of April 5, about one hundred and fifty persons interested in science met in the hall of the Columbian University, Washington, to pay a tribute to the memory of Asa Gray. Prof. Langley, Secretary of the Smithsonian Institution, presided, and addresses were delivered by Prof. Chickering, Dr. Vasey, Prof. L. F. Ward, and Dr. C. V. Riley.

The sixty-first meeting of the German Association of Naturalists will take place at Cologne from the 18th to the 23rd of September next. Prof. Bardenheuer and the chemist Th. Kyll are the secretaries. The subjects to be considered will be divided into thirty sections.

The following sums for the furtherance of scientific studies have been presented by the Academy of Sciences at Berlin: 1500 marks (£75,) to Dr. Goldstein (Berlin), a physicist; 2000 marks (£100) to Dr. Fabricius (Berlin), the archæologist, and Dr. Suhlmann (Würzburg); and 900 marks (£45) to Prof. Gerhard (Eisleben).

Captain C. E. Dutton, of the U.S. Geological Survey, is writing his monograph on the Charleston earthquake. The reports on which it will be based are complete, and in shape for the printer. *Science* is of opinion that no earthquake of ancient or modern times has been observed with such care and fulness of detail. Besides the observations made by Professors in several Colleges, by hundreds of railway officials, and at signal stations, a large number of intelligent private citizens have given an account of their own experiences. The volume which Mr. Dutton is editing will also contain a report on the Sonora earthquake.

On the night of April 17 a magnificent display of the aurora borealis was observed at Motala, in Sweden, in the northern sky. On the same night at 9.5 p.m. a phenomenon was seen in the north-western sky at Orebro, also in Central Sweden, having the appearance of a bright horizontal flash of lightning, but without any report. It was followed by the appearance of an unsteady and varying aurora. The thermometer stood at 21° C.

On the night of March 27 a rumbling noise like that of a distant earthquake was heard at Aaseral, in Southern Norway, but no shock was felt. It could not have been thunder, as the weather was clear and intensely cold.

According to the official report of the recent great earthquake in Yunnan Province of China, the shocks commenced between 5 and 6 p.m. on January 14, and lasted till 4 o'clock the following morning. During this period about ten serious shocks were counted, all being accompanied by a noise like thunder. In district cities in the south of the province, the town walls were either thrown down or cracked, while public offices and temples shared the same fate. In the city of Shih-ping large numbers of private houses were destroyed, those in the south and east quarters suffering most, while those which remained standing had cracked or slanting walls. Two hundred persons were killed in this town alone, and 3000 were injured. In and around this single city about 5000 persons were killed and injured. Most of the people were left without homes, and were starving, as the provisions were buried in the ruins of the houses. In one town the gaol was thrown down by the shocks, and all the prisoners escaped. The earthquake is said to be the most destructive ever recorded in China. The locality in which it was most violent is mountainous, and produces copper and a particular kind of tea for which Yunnan is famous. The area of disturbance is said to be about 770 miles from east to west, and 60 from north to south, Shih-ping being near the centre. The direction of the shocks appears to have been at right angles to the prevailing direction of the valleys, lakes, and rivers of the region. This, at least, is how the Pekin correspondent of a Shanghai newspaper reads the report; and he adds that from the centre of intensity, a little to the west of the city of Shih-ping, there was a decided extension of the earthquake-wave northward in the direction of the Yunnan lake Tienchih, as well as westward to the city of Weiyuen.

It is curious to notice that on the day when this earthquake occurred there was one also at Luchon, a town in the Szechuen Province, about 350 English miles north-east of the locality of the Yunnan earthquake. Much loss of life is said to have taken place here also, and there was a great subsidence of land. No official report respecting this second earthquake has yet made its appearance.

The Manilla Government has intrusted to the Sub-Director of the local Observatory the task of studying the causes of the numerous storms which prevail along the coast of the Philippine Archipelago as well as inland, with a view to drawing a meteorological chart of the islands, and of establishing their magnetic positions.

The Pilot Chart of the North Atlantic Ocean for the month of March, issued by the United States Hydrographer, contains the following interesting facts. Three pronounced cyclonic storms passed over the North Atlantic during the month. One of these was in some respects one of the most remarkable and destructive storms ever experienced along the Atlantic coast of the United States. After traversing the entire American continent from west to east without any noteworthy energy, it gained terrific force on reaching the coast to the southward of Hatteras on the 11th. Its progress eastward was delayed from the 11th to the 15th by an area of high barometer, and it then resumed its course easterly with renewed energy, crossing the 40th meridian in about 50° N. latitude. Much less fog was experienced off the Grand Banks than usual during March. Field ice was encountered as far south as 43° N., and between 46° and 60° W., but the amount reported was not great. Earthquakes were experienced by the United States store-ship at Coquimbo on January 4, and by the British ship *Diadem* in latitude 26° 2′ N., longitude 63° 19′ W, on March 1. The sensation in the latter case was as though the vessel had grounded upon a reef.

In the storm to which reference is made in the preceding note, oil seems to have been freely used off the coast of the United States for the calming of the waves. According to *Science*, more than a dozen captains and sailing-masters caught in the tempest when at its worst believe their vessels were saved by this expedient. The sailing-master of the yacht *Iroquois* reports that when furious waves with an immense comb were approaching they were deprived of their power to do harm by "a patch of oil no larger than a dining-room table."

ANOTHER interesting mineral synthesis has just been effected by M. Dufet. Native di-calcium arsenate, pharmacolite, occurs very sparingly upon the known parts of the surface of our globe, and is so rarely found in well-defined crystals that M. Des Cloizeaux has only just completed his investigation of its mineralogical and optical properties. Generally it is found in the form of silky fibres, but is at times met with in perfect monoclinic prisms of pearly lustre and frequently possessing a pink tint. M. Dufet has succeeded in producing these beautiful crystals by a very ingenious method. Two concentric vases, the outer containing nitrate of lime and the inner di-sodium arsenate, were filled with water, and so arranged that very slow diffusion occurred between the two liquids. The conditions of Nature were evidently very closely imitated, for the very gradual precipitation thus brought about resulted in the formation of groups of crystals, exactly resembling those of pharmacolite. Goniometrical measurements showed that they belonged to the monoclinic system; and the close approximation of the fundamental angles to those of the mineral given by Haidinger and Schrauf, and especially the still more remarkable closeness to the values just arrived at by M. Des Cloizeaux, leave no doubt as to the identity of the artificial with the natural. The chemical analysis of M. Dufet's crystals leads to the formula $HCaAsO_4 + 2H_2O$, and it thus becomes chemically as well as physically isomorphous with brushite, the corresponding phosphate of calcium, $HCaPO_4 + 2H_2O$. This result clears up the discrepancy between the acknowledged formula of the latter mineral and that given by older mineralogists for pharmacolite, $2HCaAsO_4 + 5H_2O$. The number of minerals which have now been reproduced in the laboratory must be very considerable, and every day the likelihood is increasing that those noble species which have for ages been prized as gems may discover the secret of their formation to some indefatigable worker. Rubies and sapphires have already yielded, possibly the diamond may not prove refractory much longer.

A VALUABLE paper, describing a new method of extraction of the alkaloids from Cinchona bark by cold oil, as used at the Government Cinchona Factory in Sikkim, was lately drawn up by order of the Lieutenant-Governor of Bengal, and has now been issued. Dr. King, the Superintendent of the Sikkim Plantation, carried on a long series of experiments on an acid and alkali process of manufacture, by which he succeeded in producing an excellent quinine. He never, however, succeeded in recovering much more than half of the amount contained in the bark on which he operated. The acid and alkali process had, therefore, to be abandoned, as wasteful and inefficient. A process depending on the maceration of the bark in spirit was next tried, but, after much experiment, it was in turn abandoned. During a visit which Dr. King paid to Holland in 1884, he obtained some hints as to a process of extraction by means of oil. Benefiting by the advice of some chemical friends, Mr. Gammie, the resident manager in Sikkim, has been able to perfect this process, with the result that the whole of the quinine in yellow bark can be extracted in a form indistinguishable, either chemically or physically, from the best brands of European manufacture. This can be done cheaply, and the Bengal Government has caused an account of the matter to be printed, in order that private growers of Cinchona may be enabled to take full advantage of the process, and that a permanent reduction in the price of quinine may ensue.

THE Trustees of the Indian Museum, Calcutta, have issued a circular announcing that they have had under their consideration the means whereby a useful scientific examination of the insect-pests of India can be best effected. Bearing in view the great economic importance of the investigation, they have directed the first assistant, Mr. E. C. Cotes, to consider it an essential portion of his duties, and have instructed him to communicate with persons interested in the subject, and likely to aid the inquiry, in order to collect materials which may form a sufficient basis for really scientific conclusions. Mr. Cotes will gradually record the entire life-histories and practical methods of dealing with the principal insect-pests, publishing from time to time, as materials accumulate, the information collected, and distributing it to those interested. Those who live in the districts where the insects occur, and have actual experience of the pests, are invited to send to Mr. Cotes accounts of facts they have observed; and the circular includes a full statement of the points upon which information is wanted.

READERS interested in the science and practice of forestry will be interested in the perusal of a Report by the American Consul at Mayence, on Forest-Culture in Hesse, contained in the January issue of the Consular Reports of the United States. The writer discusses the organizations and functions of the department having the care of forests, the duties of the various classes of officials employed in forest-cultivation, the economical results of the system pursued, the course of instruction followed in the schools of forestry, the organization and methods of the institution for experimental forestry, and the degree and amount of control assumed by the State over private forests. The Report is exceedingly detailed, and is practically a handbook of forestry as practised in the Grand Duchy.

PROF. BLANCHARD, the well-known entomologist, has just published in Paris a book on "La Vie chez les Êtres animés," in which he discusses Darwinism at length, but in a very incomplete manner, and of course in a hostile spirit.

THE address delivered by Mr. A. D. Michael, President of the Quekett Microscopical Club, on the 24th of February last, is printed in the Club's Journal, and has also been issued separately. The subject is "Parasitism."

PROF. HENRY DRUMMOND has in the press a new book, "Tropical Africa," which will be published immediately by Messrs. Hodder and Stoughton. It will contain an account of the author's recent travels in Central Africa, with one or two chapters of natural history.

MR. LEWIS, of Gower Street, will publish immediately a volume of "Physiological and Pathological Researches," by the late T. R. Lewis, F.R.S. (elect). The work is edited by Sir William Aitken, F.R.S., G. E. Dobson, F.R.S., and A. E. Brown, and contains five maps, forty-three plates, including chromo-lithographs, and sixty seven wood engravings.

AT the meeting of the Institution of Civil Engineers on Tuesday, April 24, Mr. E. B. Ellington read a paper on the distribution of hydraulic power in London. In the course of his remarks he took occasion to refer to the large extent to which lifts are now used, and he considered it necessary, he said, to urge the importance of securing the greatest possible safety in their construction by the general adoption of the simple ram. Suspended lifts depended on the sound condition of the ropes or chains from which the cages hung. As they became worn and untrustworthy after a short period, it was usual to add safety appliances to stop the fall of the cage in case of breakage of the suspending ropes, but these appliances could not be expected to act under all circumstances.

MISS MARIE BROWN, well known for her researches on the earliest colonization of North America by the Scandinavians, has presented a petition to the United States Congress urging that steps should be taken to secure a thorough search of the

Vatican and other Italian libraries with a view to further light being thrown upon this question.

MR. W. CHANDLER ROBERTS-AUSTEN will give the discourse on Friday evening, May 11, at the Royal Institution in place of Mr. W. H. Barlow, who is unwell.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus* ♀), from India, presented by Mr. Lionel H. Hanbury; a Macaque Monkey (*Macacus cynomolgus* ♂), from Burma, presented by Mrs. G. E. Buchanan; a Scarlet Ibis (*Eudocimus ruber*), a Roseate Spoonbill (*Platalea ajaja*), from Brazil, presented by Mr. Charles Booth; a Common Kestrel (*Tinnunculus alaudarius*), British, presented by Mr. H. Weetman, F.Z.S.; a Hoffmann's Sloth (*Cholopus hoffmanni*), from Panama, deposited; three Lined Finches (*Spermophila lineola*), from South America, purchased; two Persian Gazelles (*Gazella subgutterosa* ♂ ♀), two Chinchillas (*Chinchilla lanigera*), born in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 MAY 6–12.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 6

Sun rises, 4h. 24m.; souths, 11h. 56m. 25·9s.; sets, 19h. 29m.: right asc. on meridian, 2h. 55·5m.; decl. 16° 44′ N. Sidereal Time at Sunset, 10h. 29m.

Moon (New on May 11, 1h.) rises, 3h. 15m.; souths, 8h. 49m.; sets, 14h. 34m.: right asc. on meridian, 23h. 47·5m.; decl. 5° 36′ S.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Right asc. and declination on meridian. h. m.	 ° ′
Mercury..	4 16 ...	11 36 ...	18 56 ...	2 35·1 ...	14 29 N.
Venus ...	3 56 ...	10 49 ...	17 42 ...	1 47·9 ...	9 35 N.
Mars ...	16 9 ...	21 51 ...	3 33*...	12 51·5 ...	4 15 S.
Jupiter ...	20 53*...	1 9 ...	5 25 ...	16 6·7 ...	19 52 S.
Saturn ...	9 16 ...	17 13 ...	1 10*...	8 12·5 ...	20 35 N.
Uranus...	16 13 ...	21 52 ...	3 31*...	12 52·3 ...	4 52 S.
Neptune..	5 7 ...	12 50 ...	20 33 ...	3 49·6 ...	18 25 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

May. h.
9 ... 9 ... Venus in conjunction with and 3° 50′ north of the Moon.
10 ... 22 ... Mercury in conjunction with and 5° 6′ north of the Moon.
11 ... 0 ... Mercury in superior conjunction with the Sun.

Saturn, May 6.—Outer major axis of outer ring = 40″·2; outer minor axis of outer ring = 14″·3: southern surface visible.

Variable Stars.

Star	R.A. h. m.	Decl. ° ′		h. m.	
R Andromedæ ...	0 18·1 ...	37 57 N. ...	May 10,		*M*
U Cephei	0 52·4 ...	81 16 N. ...	,, 7,	2 19	*m*
			,, 12,	1 58	*m*
ζ Geminorum ...	6 57·5 ...	20 44 N. ...	,, 10,	0 0	*m*
δ Libræ	14 55·0 ...	8 4 S. ...	,, 8,	21 12	*m*
U Coronæ	15 13·6 ...	32 3 N. ...	,, 7,	20 39	*m*
U Ophiuchi... ...	17 10·9 ...	1 20 N. ...	,, 7,	2 56	*m*
		and at intervals of		20 8	
Z Sagittarii... ...	18 14·8 ...	18 55 S. ...	,, 8,	0 0	*m*
U Sagittarii... ...	18 25·3 ...	19 12 S. ...	,, 7,	2 0	*m*
			,, 10,	1 0	*M*
η Aquilæ	19 46·8 ...	0 43 N. ...	,, 8,	0 0	*M*
T Aquarii	20 44·0 ...	5 34 S. ...	,, 7,		*m*
δ Cephei	22 25·0 ...	57 51 N. ...	,, 8,	23 0	*m*

M signifies maximum; *m* minimum.

Meteor-Showers.

	R.A.	Decl.	
Near ε Crateris	170° ...	10° S. ...	Very slow.
,, α Coronæ	232 ...	27 N. ...	Rather faint and slow.
,, ζ Draconis	260 ...	64 N. ...	Rather slow.

GEOGRAPHICAL NOTES.

THE *Mouvement Géographique* contains details of Lieut. Van Gèle's recent exploration of the River Mobangi, the great tributary of the north bank of the Congo, which discharges a little below the equator. It will be remembered that the Rev. George Grenfell succeeded in making his way up the river as far as 4° N. latitude, where he was stopped by the Zongo rapids. Lieut. Van Gèle started on October 26 last, and reached the rapids on November 21. There are six of them, covering a space of 34 miles. They are situated in what is really a mountain gorge, the mountains, in gentle slopes, coming down to the river banks. The steamer *En Avant* had to be unloaded several times and dragged up the rapids. The spaces between the rapids are mostly covered with islands, with great bars of rock stretching between them. The country on each side is described as being fine, fertile, and covered with villages. The people here are all of the same tribe; head shaved except at the nape, bristling moustaches, and no tattooing. Above the middle falls, the Bakombé inhabit the country. These arrange the hair in *queues*, some of which are over 6 feet long. From the upper end of the falls the river continues in a north-east direction for about 32 miles, when it rounds to the east. It has a breadth of about 2600 feet, and the navigation is easy, the average depth being 14 feet. The easterly direction is maintained as far as the *En Avant* went, about 172 miles further. The mountains disappear from the right bank, and the left is marked by low hills, with grassy plains and woods alternating. The villages are at some distance from the river, but the people came down to the vessel in crowds all the way up, and were perfectly friendly until the last few days. Over the whole course tropical cultures of every kind were abundant, as well as sheep, goats, and fowls. The natives on the right bank belong to the Buraka and Maduru tribes; those on the right to the Bakangi, the Mombate, and the Banzy. They mostly shave the head so as to leave a triangle of hair, with the forehead as base. The ears are enormously elongated with heavy copper rings. The river here is covered with islands, mostly cultivated and inhabited. Among the Banzy the huts have the shape of huge conical extinguishers, resting on a circular wall about 2 feet high. These huts are ranged in circular rows, forming broad streets, well kept, and with a common meeting-house in the centre. Each hut is divided into two apartments, one used for sleeping. Iron is admirably worked into all sorts of implements, weapons, and ornaments. Ivory is abundant, but used only for bracelets, anklets, and *pelelé* or lip-ornaments. About 100 miles above the Zongo rapids a second is met with, at Bemay. The vessel succeeded in passing it, and a third 25 miles further up. Just above Bemay, the only tributary met with from the Zongo rapids upwards—the Bangasso—discharges into the right bank of the Mobangi. Above the river the country is densely peopled by the Mombongo and Yakoma, and these showed themselves distinctly hostile to the expedition. There were unfortunately several conflicts, in which lives were lost on both sides. Rocks and sand-banks obstructed the navigation, and after getting as far as 21° 55′ E., Lieut. Van Gèle turned back, making his way downwards with some difficulty, as the river had lowered about 10 feet. He arrived at Equator Station on February 1. The river was about 8000 feet wide at the furthest point, and covered with islands, mostly inhabited. On the north bank of the river, one village extended along a distance of 3 miles. As Dr. Junker's furthest point on the Wellé was 22° 55′ E., only 1° of longitude separates his point from Van Gèle's furthest, or about 68 miles. As they are both on the same line of latitude, there can be no doubt that the Mobangi and the Wellé are the same river.

FROM an official Report by Mr. Percy Smith, Assistant Surveyor-General of New Zealand, on a visit to the Kermadec Islands, in August last, we glean some information as to this recent annexation to the British dominions. The group is situated between the parallels of 29° 10′ and 31° 10′ S. lat., and between the meridian of 177° 45′ and 179° W. long. There are four islands, with some outlying islets and rocks, the most northerly, Raoul or Sunday Island, being 674 miles north-east of Auckland. The islands are all volcanic; in two of them, indeed, signs of volcanic activity are to be seen at the present day, though on a limited scale. They appear to be situated on an oceanic plateau which extends from New Zealand to the Tonga Group, on which soundings are obtained at depths much less than in the adjacent areas, but still so great as to show that the islands form, as it were, the tops of volcanic cones rising to